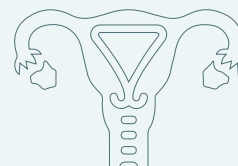


The superiority of Myo-Inositol over D-Chiro-Inositol

in PCOS-related infertility



Polycystic ovarian syndrome (PCOS)-related infertility presents a complex challenge for practitioners. The differentiation between myo-inositol (MI) and D-chiro-inositol (DCI) is crucial for effective treatment outcomes. Recent research highlights the superiority of MI and raises concerns about the potential harm of DCI on fertility.¹

Scrutinising the clinical data

The question about different inositol isomers has arisen due to clinical trials **using a combination of both MI and DCI in a 40:1 ratio in PCOS that are based on flawed and misleading statements.**^{1,2} An often cited 2014 study by Pizzo et al,² in favour of the 40:1 ratio, concluded that MI was most effective at improving metabolic parameters, while DCI reduced hyperandrogenism more effectively.

However, there is a discrepancy between the abstract statement and the actual data reported in the above study. The data clearly shows that **4g of MI led to a statistically significant decrease in the LH:FSH ratio, total testosterone, prolactin, androstenedione and HOMA-IR scores**, as well as a **greater increase in SHBG** compared to 1g of DCI. DCI did show some decreases in LH and free testosterone and a slight increase in SHBG, but not in a clinically significant way. The analysis of the data confirms that MI has significant effects on both the metabolic profile **AND** reducing hyperandrogenism.²

Harmful effects of elevated DCI in PCOS

Abnormal ovarian ratios of MI:DCI is a feature of PCOS and this altered ratio is induced by high insulin levels and increases in the one-way conversion³ of MI-to-DCI.¹ **Too much DCI increases testosterone synthesis in the ovarian thecal cells,¹ reduces oocyte maturation and deteriorates the quality of blastocysts created via in vitro fertilisation.**^{1,4}

In addition, the absorption of MI is reduced when dosed simultaneously with DCI since the two isomers compete with each other for the same transporter.⁴

Superior fertility outcomes with myo-inositol alone

In a 2020 study comparing MI to DCI, the inclusion of 4g of MI alone resulted in successful conception rates of 45.5% in infertile women with PCOS, surpassing the 42% success rate in the MI with metformin group. These **findings highlight the standalone efficacy of MI in improving fertility.**⁵

MI also exerts a strong antiandrogenic effect, improving the ratio of follicle-stimulating hormone (FSH) to luteinizing hormone (LH).⁶

With these results, our clinical rationale would be to ask the question, is the use of DCI needed in the treatment of PCOS-related infertility or is it counterintuitive? The 40:1 MI to DCI ratio is most commonly researched for the treatment of PCOS and related infertility, however we see from recent studies that the heavy lifting is really being done by 4g of MI and its antiandrogenic effect on improving FSH:LH ratios.⁵ **The inclusion of 50mg of DCI only provides a direct path to increased testosterone biosynthesis and hinder reproductive success.**³

Quality assurance with listed products

There is **high variability in inositol quality** on the market. Using an inositol manufactured to listed medicine standards guarantees a therapeutic ingredient, provides the highest allergen control, is screened for contaminants and has a cleaner excipient profile. This provides confidence and assurance for those vulnerable and sensitive patients.

DCI is not currently a listable ingredient with the Therapeutic Goods Administration in Australia. This **raises concerns** about ingredient quality, good manufacturing practices, and lack of contaminant testing.

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